

CLAIMS

What is claimed is:

1. A method for forming an endovascular occlusion comprising the step of controlling injection of a purified alginate liquid and injection of a calcium chloride solution to a targeted area within a vascular system, wherein injection of the purified alginate liquid and injection of the calcium chloride solution begin or end asynchronously.
2. The method according to claim 1, wherein the purified alginate liquid has a high guluronic acid content.
3. The method according to claim 1, wherein the purified alginate liquid is of low molecular weight.
4. The method according to claim 1, wherein the purified alginate liquid has a high guluronic acid content and is of low molecular weight.
5. The method according to claim 1, wherein the injection flow rate of the calcium chloride solution is continuous during injection.
6. The method according to claim 1, wherein the injection flow rate of the calcium chloride solution is variable during injection.
7. The method according to claim 1, wherein injection of the calcium chloride solution occurs at staged intervals.
8. The method according to claim 1, wherein the injection flow rate injection of the calcium chloride solution is continuous during injection and injection of the purified alginate liquid occurs at staged intervals.

9. The method according to claim 1, wherein the injection flow rate of the alginate liquid is continuous during injection.

10 The method according to claim 1, wherein the injection flow rate of the alginate liquid solution is variable during injection.

11. The method according to claim 1, wherein injection of the alginate liquid solution occurs at staged intervals.

12. The method according to claim 1, wherein the injection flow rates of the alginate liquid and the calcium chloride solution are about equal during injection.

13. The method according to claim 1, wherein the injection flow rates of the alginate liquid and the calcium chloride solution are different during injection.

14. The method according to claim 1, wherein injection of the alginate liquid and injection of the calcium chloride solution occur at staged intervals.

15. The method according to claim 1, wherein one or more agents are added to the alginate liquid during the controlled injection.

16. The method according to claim 15, wherein the one or more agents are selected from the group consisting of therapeutic drugs, radioactive or contrast agents, growth enhancers or inhibitors, or any combination thereof.

17. A method for forming an endovascular occlusion comprising the steps of:

a. Providing a catheter comprised of at least two lumens, and

b. Forming a calcium alginate polymer in a targeted area within a vascular system by controlling injection of a purified alginate liquid and injection of a calcium chloride solution to the targeted area through the catheter, wherein the polymer is formed external to the catheter within the target site and wherein injection of the purified alginate liquid and injection of the calcium chloride solution begin or end asynchronously.

18. The method according to claim 17, wherein the purified alginate liquid has a high guluronic acid content.

19. The method according to claim 17, wherein the purified alginate liquid is of low molecular weight.

20. The method according to claim 17, wherein the purified alginate liquid has a high guluronic acid content and is of low molecular weight.

21. The method according to claim 17, wherein the at least two lumens are concentric.

22. The method according to claim 17, wherein the injection flow rate of injection of the calcium chloride solution is continuous during injection and injection of the purified alginate liquid occurs at staged intervals.

23. A method for forming an endovascular occlusion comprising the steps of:

- a. providing at least one assist device to a targeted area in a vascular system, and
- b. controlling injection of a purified alginate liquid and injection of a calcium chloride solution to the targeted area, wherein injection of the alginate liquid and injection of the calcium chloride solution begin or end asynchronously.

24. The method according to claim 23, wherein the at least one assist device comprises a coil, a stent, a balloon, or any combination thereof.

25. A method for forming an endovascular occlusion comprising the steps of:

- a. providing an ion-permeable balloon to a targeted area in a vascular system,
- b. controlling injection of a purified alginate liquid having a high glucuronic acid content to the targeted area; and
- c. controlling injection of a calcium chloride solution to the targeted area by injecting the calcium chloride solution into the ion-permeable balloon.

26. A method for forming an endovascular occlusion comprising the steps of:

- a. providing a balloon to a targeted area in a vascular system, and
- b. controlling injection of a purified alginate liquid having a high glucuronic acid content and injection of a calcium chloride solution to the targeted area, wherein the alginate liquid and the calcium chloride solution are injected asynchronously and wherein the balloon has one or more built-in catheters.

27. A method for forming an endovascular occlusion comprising the steps of:

a. providing at least one pre-coated coil to a targeted area in a vascular system, and

b. controlling injection of a purified alginate liquid having a high glucuronic acid content and injection of a calcium chloride solution to the targeted area,

wherein injection of the alginate liquid and injection of the calcium chloride solution begin or end asynchronously.

28. The method according to claim 27, wherein the coil is pre-coated with at least a conformal coating of alginate gel.

29. The method according to claim 27, wherein the coil is pre-coated with at least a conformal coating of unreacted alginate liquid.

30. The method according to claim 27, wherein the coil is pre-coated with at least calcium chloride ions.

31. The method according to claim 27, wherein the coil is pre-coated with collagen, permeable gel, or polymer material.

32. The method according to claim 28, wherein the coil is modified by ion implantation before placement of the coil in the targeted area.